EFFECT OF DIRECT HEALTH FACILITY FINANCING ON THE AVAILABILITY OF DIABETIC AND HYPERTENSIVE HEALTH COMMODITIES IN PRIMARY HEALTH FACILITIES IN DODOMA REGION, TANZANIA

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By

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A Dissertation Submitted in (partial) fulfillment of the requirements for the degree of Masters of Science in Health Economics and Policy at

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CERTIFICATION

The undersigned certify that they have read and hereby recommend for acceptance by Muhimbili University of Health and Allied Sciences a dissertation titled ***"Effect of Direct Health Facility Financing on the Availability of Diabetic and Hypertensive Health Commodities in Primary Health Facilities in Dodoma Region"*** in partial fulfillment of the requirement for the degree of Masters of Science in Health Economics and Policy of Muhimbili University of Health and Allied Sciences.

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Dr. Frida Ngalesoni

(Supervisor)

Date_____

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Dr. George Ruhago

(Supervisor)

Date_____

DECLARATION AND COPYRIGHT

I, **Selemani Abdi Yondu** declare that this dissertation is my original work and that it has never been presented and will not be presented to any other University for a similar or any other degree award.

Signature …… Date ……

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DEDICATION

This work is dedicated to my beloved wife, Asha Kilua, and my dear children, Yassir and Yussayrah, for their unwavering tolerance, patience, and support throughout the entire duration of my studies. Your love and understanding have been my greatest source of strength.

ABSTRACT

Background: In 2017, the Government of Tanzania launched Direct Health Facility Financing (DHFF) reforms, among others, aimed at enhancing the quality of health services in primary healthcare facilities and increasing the availability of essential health commodities. With the growing prevalence of Non-Communicable Diseases (NCDs), it became essential to examine the effect of DHFF on the availability of health commodities for diabetes and hypertension in these facilities. This study assessed how DHFF influenced the availability of diabetic and hypertensive health commodities in rural and urban primary healthcare facilities in the Dodoma Region.

Methods and Materials: A cross-sectional analytical study design using a quantitative approach was conducted in two selected districts of the Dodoma region, with both rural and urban representation. Budget, allocation, and expenditure data were extracted from the financial systems covering three (3) years to establish a trend concerning NCDs. In addition, data on the availability of hypertensive and diabetic health commodities were extracted from the electronic Logistic Management Information System (eLMIS). Financial data were analyzed by using Microsoft Excel. Budget, allocation, and expenditure data were disaggregated by level of healthcare facility and fund sources. These data constituted the essential/tracer commodities used in managing NCDs and were disaggregated further by the level of health facilities, source, and geographical location.

Results: The overall availability trends for hypertensive and diabetic commodities have generally improved over the years with an increase from 86% to 93% for 2021 to 2023, respectively. The overall availability of diabetic health commodities was higher compared to the hypertensive commodities, except for the fiscal years 2020/21. There was a significant difference in the availability of diabetic commodities between urban and rural areas each year, with rural areas consistently having higher availability compared to urban areas (p-value < 0.05). For the availability of Hypertensive health commodities, there was a significant difference in the year 2022/2023 between urban and rural (*p-value <0.008*), with urban areas having higher availability.

The overall budget for health commodities has seen a consistent increase over the years. Specifically, in the fiscal year 2021/22 the total budget allocated was 979,778,729 TZS, out

of which only 0.6% was allocated for NCD health commodities. The following year, 2022/23, showed an increase in both overall health commodities and NCD-specific allocation by 1.94%. However, in 2023/24, while the total budget for health commodities rose to 1,294,916,732 TZS, the total funds dedicated to NCDs decreased to 14,019,911 TZS. With regards to expenditure, in the fiscal year 2020/21, the total expenditure on health commodities was contributed by different funding sources that are Improved Health Insurance (iCHF), Health Sector Basket Fund (HSBF), and National Health Insurance Fund (NHIF) and User fees. The iCHF contributed 21,790,818 TZS, HSBF - 182,625,199 TZS, NHIF - 35,433,772 TZS, and User Fees - 93,681,451 TZS.

Conclusion: The findings from this study suggest an overall increase in the availability of NCDs (diabetic and hypertensive) health commodities is contributed by DHFF reforms implementation by primary health facilities. Also, the study found disparities in the availability of NCD health commodities between facilities located in rural and urban areas with better availability in urban.

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ABBREVIATION

CCHP	Council Comprehensive Health Plans
DHFF	Direct Health Facility Financing
eLMIS	Electronic Management Information System
FFARS	Facility Financial Reporting System
HBF	Health Basket Fund
HFGC	Health Facility Governing Committees
iCHF	Improved Community Health Fund
IRB	Institutional Review Board
LMICs	Low and Middle-Income Countries
MSD	Medical Store Department
MUHAS	Muhimbili University of Health and Allied Sciences
NCDs	Non-Communicable Diseases
NHIF	National Health Insurance Fund
OPD	Out-Patient Department
PHC	Primary Health Care
PLANREP	Planning and Reporting System
WHO	World Health Organization

DEFINITION OF TERMS

Direct Health Facility Financing (DHFF) – A health financing reform initiative is put into action to enhance the effectiveness of the healthcare system by allocating funds directly to primary healthcare facilities. This is intended to enhance the provision of healthcare services and attain universal health coverage (UHC) (1).

Hypertension –Hypertension (HTN) is the persistent elevation of systemic arterial blood. There is no sharp demarcation between normal blood pressure (BP) and HTN. However, for clinical purposes, it is defined as systolic blood pressure (SBP) of ≥140 millimeters of mercury (mmHg) and/or diastolic BP (DBP) of ≥90 mmHg(2)

Diabetes Meletus (DM) - Diabetes mellitus (DM) is mainly defined by elevated levels of glucose in the blood (hyperglycemia), excessive thirst (polydipsia), and increased appetite (polyphagia). It's a prevalent metabolic disorder experiencing a concerning rise globally. According to the World Health Organization (WHO), diabetes is projected to become the seventh leading cause of death by 2030(3).

Primary Health Care (PHC) - is essential health care made universally accessible to individuals and families in the community by means acceptable to them, through their full participation and at a cost that the community and country can afford (4). In Tanzania Primary Health Care Facilities refer to Council hospitals, health centers, and dispensaries.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Before the introduction of Direct Health Facility Financing (DHFF) in Tanzania, primary healthcare facilities faced numerous challenges that severely impacted their ability to provide adequate services and maintain a consistent supply of health commodities (5). The healthcare system struggled with chronic underfunding, as most of the funds disbursed were not reaching the particular facilities to meet the needs of the facilities. This lack of funding led to regular shortages of health commodities in primary healthcare facilities leading to worse health outcomes for the community(6). Additionally, the bureaucratic processes surrounding fund disbursement were often cumbersome and slow, creating further obstacles for primary healthcare facilities. Consequently, healthcare workers struggled to procure necessary commodities, and many facilities had to rely on dwindling stocks or alternative, often less effective, sources (7). This situation undermined the quality of care and eroded public trust in the healthcare system, as communities frequently faced barriers to accessing vital health services.

In the last decade, the Tanzanian government has made advancements in enhancing healthcare delivery through improvement of health system financing by introducing public financing management reforms. One of the major reforms includes the introduction of the DHFF Councils in the 2017/18 Financial Year (8). The primary objective of decentralization in the health sector is to enhance efficiency, encourage innovations, and elevate healthcare quality, patient experiences, and accountability (9).

The implementation of the DHFF program in Tanzania is anticipated to play a pivotal role in improving the quality of health service delivery and increasing service utilization, ultimately contributing to improved health system performance (9). The introduction of the DHFF policy has empowered health facilities to organize and allocate funds based on their specific needs. These facilities now have the independence to procure health commodities. DHFF in Tanzania is operationalized through the Facility Financial Accounting and Reporting System (FFARS). FFARS is a software application designed for tracking budget disbursement, and expenditures, and generating reports at various levels including facility,

council, regional, and national levels (10). Alongside the implementation of DHFF and FFARS, the Government of Tanzania (GoT) has created a web-based planning and budgeting tool called PlanRep. This tool aids in strategic planning and resource allocation. Furthermore, frameworks like the Comprehensive Council Health Planning (CCHP) and Health Facilities Planning have been implemented to facilitate the efficient allocation of resources, including health commodities (8). At the beginning of the DHFF implementation, the average availability of health commodities was 69%, however, following the implementation, this figure rose to a high of 78% in one year of implementation (10).

Current studies indicate that Non-Communicable Diseases (NCDs) are responsible for 73% of worldwide fatalities with hypertension and diabetes on top of the causes (11). Sub-Saharan Africa's prevalence rates are 48% and 5.1% for hypertension and diabetes respectively, and it is projected in 2030, NCDs will surpass infectious diseases as primary contributors to both morbidity and mortality (12).

There have been disparities in the provision of NCDs services in Tanzania as predominantly occurs at secondary and tertiary level care, contradicting existing policies that stipulate primary health care should be the first point of care for all health services. Among adult outpatient who visits healthcare facilities, a substantial 58% were related to chronic diseases, whereas health centers accounted for 20% of such visits, and dispensaries for 13%(13). This discrepancy in service utilization per level of facility highlights a notable disparity between policy intentions of most OPD services to be provided by primary healthcare facilities other than tertiary facilities and the current distribution of outpatient services for NCDs in the country (13). Also, there have been equity issues regarding the availability of health commodities between the rural and urban divide with an improvement in urban areas (14).

This study assessed the availability of diabetic and hypertensive health commodities in primary healthcare facilities with a focus on the rural and urban divide among DHFF implementing areas.

1.2 Problem statement

The implementation of the DHFF reform in Tanzania aimed to enhance the quality of healthcare delivery and boost service utilization, thereby improving the overall performance of the health system(8). Implementation of reform in primary healthcare facilities in Tanzania has demonstrated a clear enhancement in health system performance. The improvements are evident in health services, particularly in maternal health to pre DHFF era. (9). A study conducted in Pangani District to evaluate the impact of the direct health facility financing program on maternal health services revealed significant improvements in both maternal and child health services (15). At the beginning of the DHFF implementation, the average availability of health commodities was 69%, however, following the implementation, this figure rose to a high of 78% in one year of implementation (10).

With the rising prevalence of NCDs in Low and Middle-Income Countries in general and Tanzania specifically (16) There comes the imperative need to enhance care and treatment for NCDs, including diabetes and hypertension. There is limited evidence on the effects of DHFF on the availability of NCD commodities, especially in primary health care where the majority of citizens are served. With the increase in prevalences and mortalities related to NCDs in the country in both rural and urban areas a need to understand the status on availability of these health commodities in primary healthcare facilities become crucial. Hence, this gap in knowledge needs to be studied. This study assessed the availability of diabetic and hypertensive health commodities post-DHFF introduction.

1.3 Conceptual framework

The introduction of DHFF enhances the independence of health facilities in planning, budgeting, and executing budgets during implementation. This study lies in the assumption that health facilities receive financial resources directly into their facility bank accounts. Consequently, by granting providers greater autonomy in accessing and utilizing resources, it is expected to boost the involvement of health facility governing committees during the planning and financing of healthcare, encompassing diabetic and hypertensive care. By using the allocation formula as indicated in the guideline, which specifies different adjustments for each fund source, this in turn, is anticipated to improve the availability of hypertensive and diabetic health commodities, and ultimately overall quality of care, as it enables direct investment of facility resources into service delivery. Additionally, the conceptual framework assumes that health facilities receive support from higher levels through supervision and mentorship to facilitate the successful implementation of the DHFF program.

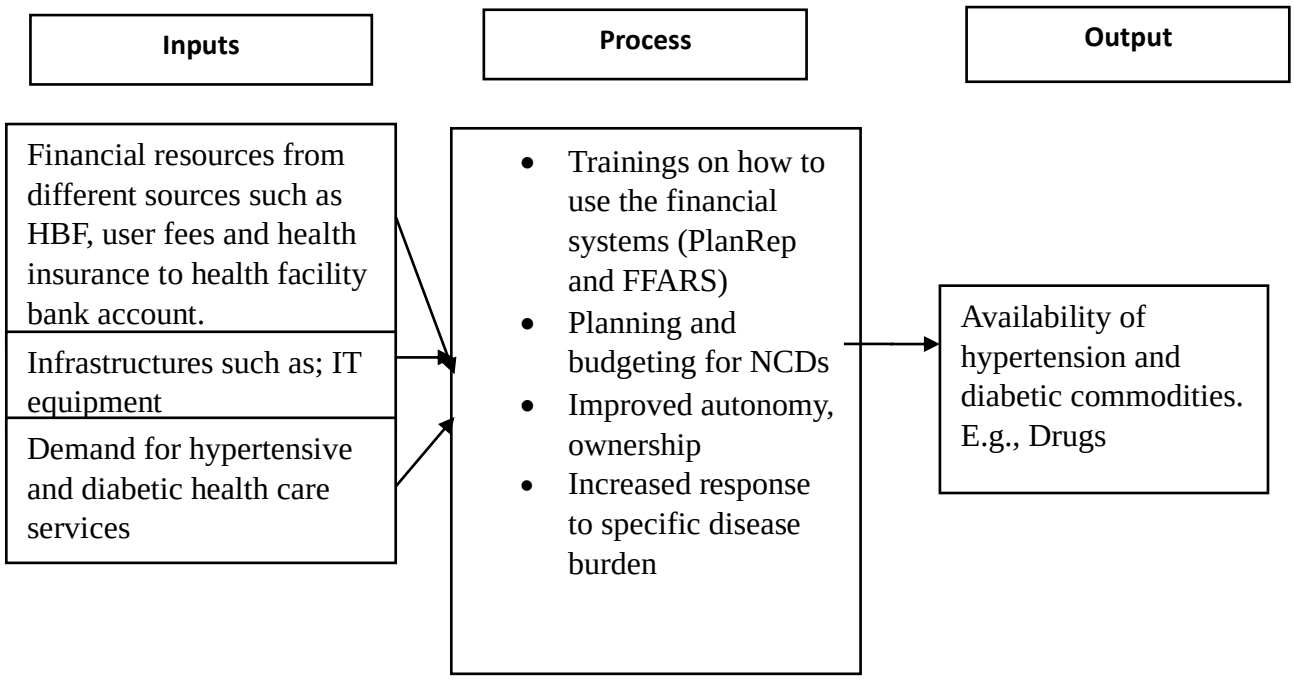


Figure 1: A conceptual framework showing the relationship between variables adapted from a study conducted to Evaluate the effect of the Direct Health Facility Financing Program in Improving Maternal Health Services in Pangani District, Tanzania (15)

1.3 Rationale

The increasing prevalence of NCDs like diabetes and hypertension presents a major global health concern. In both rural and urban settings, access to effective healthcare services is important for the prevention, management, and control of these chronic conditions. The DHFF has emerged as a potential tool to enhance provider autonomy in planning and budgeting with the ultimate goal of improving healthcare accessibility, especially in resource-constrained environments. The evidence suggests that the DHFF in Tanzania has demonstrated a clear enhancement in overall health system performance.(9,15).

Investigating the availability of hypertensive and diabetic health commodities after the introduction of DHFF will shed light on its practical effects for diverse populations. In addition, it will contribute valuable insights into the effects of DHFF frameworks on access to diabetic and hypertensive care, with a focus on bridging the healthcare divide between rural and urban areas. The study findings will help government officials in responsible ministries, healthcare workers, and stakeholders involved in healthcare to better understand how to make sure everyone with chronic illnesses can get the care they need, regardless of where they reside (rural or urban) and type of primary healthcare facility they access (District Hospitals, Health Centers and Dispensaries). This will promote better planning and budgeting in healthcare that promotes fairness for everyone, regardless of diverse geographic settings.

1.4 Research questions

1.4.1 Main Questions

What are the effects of Direct Health Facility Financing reforms on the availability of hypertensive and diabetic health commodities in primary healthcare in the Dodoma region?

1.4.2 Specific Questions

1. What is the budget trend for NCDs (diabetic and hypertensive) commodities from 2020/21 to 2023/24?
2. What is the expenditure trend for NCDs health commodities from 2020/2021 to 2022/2023?
3. What is the trend in the availability of hypertensive and diabetic health commodities at primary health care facilities in Dodoma from 2020/21 to 2022/2023?
4. What are the disparities in the availability of diabetic and hypertensive commodities between Primary Healthcare facilities in rural and urban areas?

1.5 Objectives

1.5.1 General objective

To assess the effects of Direct Health Facility Financing on the availability of hypertensive and diabetic health commodities in rural and urban primary healthcare facilities in Dodoma Region.

1.5.2 Specific objectives

1. To determine the budget trend for NCDs (diabetic and hypertensive) health commodities from 2020/21 to 2023/2024
2. To determine the expenditure trend for NCDs health commodities from 2020/2021 to 2022/2023
3. To assess the availability of hypertensive and diabetic health commodities at primary health care facilities in Dodoma from 2021/22 to 2023/24.
4. To assess the disparities in the availability of diabetic and hypertensive commodities between urban and rural DHFF implementation areas.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Planning and budgeting for Non-Communicable Diseases

The impact of NCDs goes far beyond individuals and societies and therefore a comprehensive approach requiring all sectors is needed to lessen its impact, including planning and budgeting. Poor policy awareness, inadequate funding for NCDs, poor coordination, and intersectoral engagement are among the key challenges hindering the effective implementation of NCD interventions in sub-Saharan African countries despite of increasing NCD burden (17). Studies indicate that decentralized governments tend to be more attuned to the needs of impoverished populations compared to centralized governments. Consequently, they are more inclined to develop and enact policies that benefit the poor. Furthermore, decentralization brings government entities physically and organizationally closer to the citizens they serve, fostering greater awareness and responsiveness to the people's requirements (18). Research examining the diversity in functionality among Health Facility Governing Committees (HFGCs) operating under DHFF in Tanzania suggests that the reform has enhanced the involvement of HFGCs in both fundraising efforts and planning activities (19). The finding from Tanzania indicates that DHFF has increased the accountability of HFGC to 78% (20). Furthermore, DHFF reform gives autonomy to health facilities on planning, budgeting, and spending multiple sources through FFARS (21). However, there is limited evidence on planning and budgeting for NCDs specifically.

2.2 Effect of DHFF and the availability of health commodities

Before the introduction of DHFF in Tanzania, primary healthcare facilities faced numerous challenges that severely impacted their ability to provide adequate services and maintain a consistent supply of health commodities (5). The healthcare system struggled with chronic underfunding, as most of the funds disbursed were not reaching the particular facilities to meet the needs of the facilities. This lack of funding led to regular shortages of health commodities in primary healthcare facilities leading to worse health outcomes for the community(6). Additionally, the bureaucratic processes surrounding fund disbursement were often cumbersome and slow, creating further obstacles for primary healthcare facilities. Consequently, healthcare workers struggled to procure necessary commodities,

and many facilities had to rely on dwindling stocks or alternative, often less effective, sources (7). Research into the implementation of DHFF revealed that the reform has resulted in dependable and punctual allocation of funds at the facility level, bolstering local fiscal autonomy, and promoting transparency, accountability, and community engagement (22). The DHFF has also improved the supply of health commodities to primary health facilities. Now, it is easy for the facility to purchase commodities through the Prime Vendor System by using complementary funds like HSBF, user fee, NHIF, or CHF (23). Through DHFF there is an overall increase in the supply of medicines and medical commodities (20).

A study conducted in the Pangani district, Tanzania, regarding the impact of Direct Health Facility Financing (DHFF) on enhancing maternal health, indicates a positive effect on maternal health service provision. Specifically, there has been an increase in the availability of medical supplies, equipment, and reagents essential for delivering maternal health services (15). This provides evidence that the reform may have improved other healthcare services. Moreover, an investigation evaluating the impacts of Direct Health Facility Financing on Health System Performance in Public Primary Health Facilities in Tanzania revealed notable disparities in the structural quality of maternal health services before and after the implementation of the reform (9). Different studies have revealed an increase in the availability of health commodities since the introduction of DHFF. However, there is limited evidence concerning specific NCD commodities given its alarming burden in Tanzania.

2.3 Disparities in the availability of health commodities between urban and rural areas

Several studies have indicated a gap between rural and urban areas concerning access to healthcare services. These disparities in health outcomes stem from various social, economic, and political factors that impact the distribution of health within a population differently (24). A study conducted in Tanzania found a significant difference in maternal healthcare utilization between rural and urban areas and it recommended the importance of policymakers considering the rural-urban context when crafting strategies to address the disparities in maternal healthcare access and utilization (14). Another, evidence from a study conducted in Tanzania to determine the effect of DHFF concerning the availability of

health commodities revealed a notable difference in overall health commodities financing between the urban and rural divide (8). However, there is still a knowledge gap concerning the effects of DHFF on the availability of specific NCD commodities with rural and urban disaggregation.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study and design issues

A cross-sectional descriptive study design employing the quantitative approach was used to address the study objectives. The study used secondary data, which was extracted from the financial systems which are PlanRep and FFARs to establish a budget trend for NCDs as well as the availability of hypertensive and diabetic commodities using eLMIS. The design was appropriate as it allowed the researcher to capture the exposure and outcome at a single point in time.

3.1 Study settings

The analysis of secondary data obtained included two districts of the Dodoma region, namely; Dodoma MC and Kondoa DC with both rural and urban representation. These districts were purposively selected as they constitute typical rural and urban characteristics. The selection of health facilities was based on the level of health facility i.e. hospital, health center, and dispensary with both rural and urban representations.

3.2 Sample size and sampling procedures

3.2.1 Sample size

A total of eight-one (81) primary healthcare facilities were included in the study from two councils where 43 and 39 healthcare facilities were from Kondoa District Council and Dodoma Municipal Councils.

3.2.2 Sampling procedures

A purposive sampling technique was used to select the primary healthcare facilities based on the following inclusion and exclusion criteria.

3.2.3 Inclusion criteria

1. Registered and well-functioning public primary health facilities
2. Have financial systems in place such as PlanRep and FFARS
3. Primary healthcare facilities that have been registered since 2017

3.3.3 Exclusion criteria

1. Primary healthcare facilities that have not reported budget and expenditure data from 2017 to 2023.

3.3 Study variables

3.4 Data collection methods

The study collected secondary data from the available electronic systems. Budget, allocation, and expenditure data were extracted from financial systems such as FFARS and PlanRep covering a period of 3 years that is from 2021/22 to 2023/24. In addition to health commodities data were extracted from the Electronic Logistic Management Information System (eLMIS).

Table 1: Objectives, data sources, and type of data collected

S/N	Objective	Source of data	Type of Data collected
1	To determine the budget trend for NCDs health commodities from 2020/21 to 2023/2023	Financial systems; Plan-Rep and FFARS	Budget, allocation, and expenditure data for three (3) years
2	To determine the expenditure trend for NCDs health commodities from 2020/2021 to 2022/2023	FFARS	Allocations and Expenditures data for five (3) years
3	To assess the availability of hypertensive and diabetic health commodities at primary health care facilities in Dodoma from 2020/21 to 2022/2023	eLMIS	NCD health commodities

3.5 Investigation tools, validity, and reliability issues

Quantitative data for this study were collected using Excel-based data extraction forms that consist of variables of interest. The tools were tested before data extraction to ensure that they captured the intended variables.

3.6 Data analysis

Objectives 1 and 2: To determine the budget and expenditure trend for NCDs (diabetic and hypertensive) health commodities.

Budget and expenditure data were analyzed by using Microsoft Excel. Budget allocation and expenditure data were disaggregated by level of health care facility from fund sources such as NHIF, iCHF, HBF, and User fees. Descriptive statistics were used to summarize financial data using tables and graphs to show the trend concerning NCD financing.

Objective 3: To assess the availability of hypertensive and diabetic health commodities.

About the availability of NCD health commodities, data were extracted from the eLMIS. The availability was traced using 11 and 5 health commodities for hypertension and diabetes respectively (Table 2). This data constitutes the essential/tracer commodities used

in managing NCDs and was disaggregated further by the level of health facilities and geographical location (Urban vs Rural). The availability of NCD commodities was presented in graphs to show the trends from 2020/21 to 2022/23.

Table 2: List of NCD health commodities used to trace availability in healthcare facilities through the use of eLMIS

S/N	List of hypertensive health commodities used to trace availability in eLMIS	SN	Diabetic health commodities used to trace availability
1	Frusemide Tablet 40 mg	1	Metformin 500mg + Glibenclamide 5mg Tablet - -
2	Atenolol Tablet 50 mg	2	Glibenclamide Tablet 5 mg
3	Frusemide Tablet 40 mg	3	Insulin Human (Soluble) Injection 100 IU
4	Nifedipine Retard Tablet 20 mg	4	Insulin Human Zinc Suspension (Lente) Injection 100 IU
5	Captopril Tablet 25 mg	5	Glibenclamide Tablet 5 mg
6	Furosemide injection 10/2 mg/ml		
7	Acetylsalicylic Acid (Enteric Coated) Tablet 75 mg		
8	Amlodipine Tablet 5 mg		
9	Hydralazine Tablet 25 mg		
10	Losartan + Hydrochlorothiazide Tablet 50/12.5 mg/mg		
11	Hydralazine 1ml For Injection 20 mg/ml		

Objective 4: To assess the disparities in the availability of diabetic and hypertensive commodities between urban and rural DHFF implementation areas

To assess the disparities in the availability of NCD commodities, proportions were calculated for both urban and a two-sample proportional test was done to determine whether the rural and urban health facilities differ significantly.

3.7 Ethical issues

The study was conducted after receiving ethical clearance from MUHAS and permission from the President's Office Regional Administration and Local Government. Furthermore, permission was provided to access the database through specific responsible officers PlanRep, FFARS, and eLMIS to ensure smooth engagement and data collection.

3.8 Study limitations and mitigation

The accuracy and completeness of data in some financial years impacted the study findings. This was addressed by removing all the financial years with incomplete data in the analysis, as the results, the budget and expenditure data have been analyzed for three (3) years only, instead of five (5) years. The study assessed the effect of DHFF reforms on availability of NCD commodities without having the before the reform but relied on previous studies done in the area that provided evidence on DHFF on improving overall availability of health commodities. More studies are needed that will use mixed approaches to further understand the impacts of the reforms in the long run.

CHAPTER FOUR

4.0 RESULTS

4.1 Introduction

This chapter presents the findings of this study, highlighting the effects of DHFF on the availability of hypertensive and diabetic health commodities in the Dodoma Region in Tanzania.

4.2 Demographic characteristics of the health care facilities

A total of 81 public primary health care facilities were involved in the study with both rural (Kondoa DC) and urban (Dodoma CC) representation. Out of these health facilities, the majority 82.7% were dispensaries and 17.3% were health centers as shown in Table 2 below.

Table 2: Demographic characteristics of the health facilities

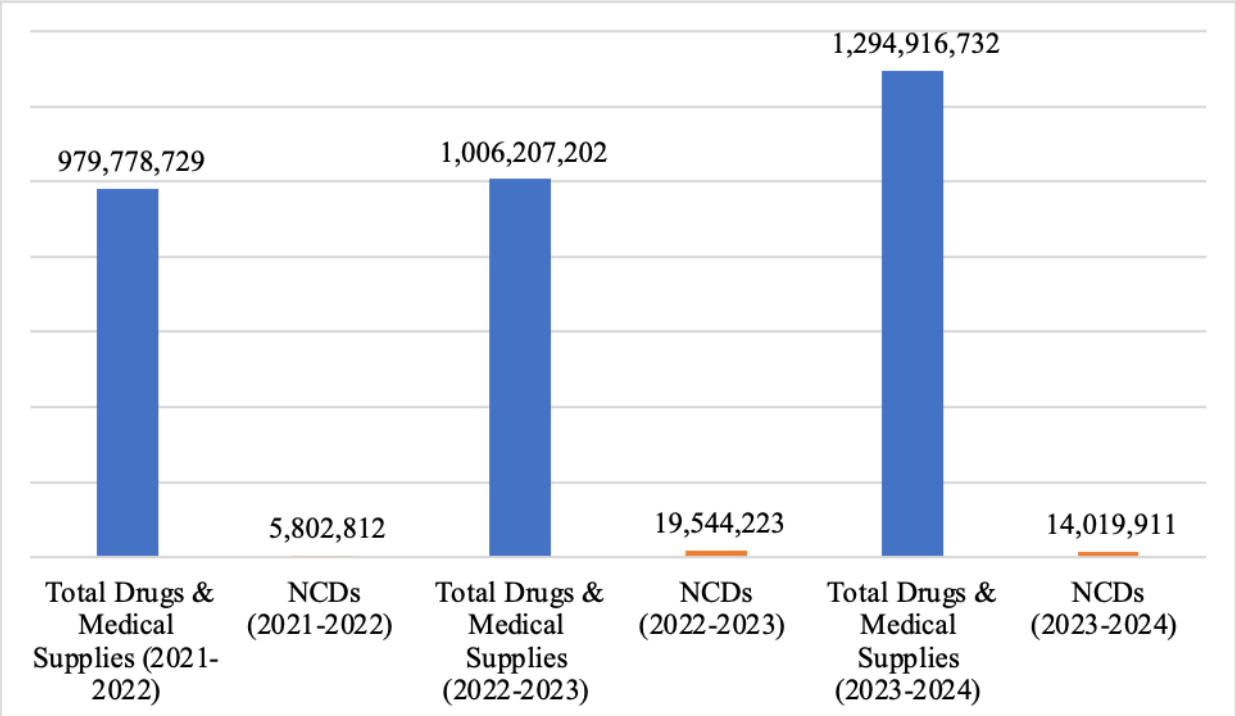
Demographic variable	Frequency (N=81)	Percentage (%)
Districts		
Kondoa DC (Rural)	43	52.4%
Dodoma CC (Urban)	38	47.0%
Level of health facilities		
Dispensaries	67	82.7%
Health Centers	14	17.3%

4.3 Budget trend (in TZS) for NCD health commodities from 2021 to 2024

4.3.1 Budget trend (in TZS) for NCD health commodities from 2021 to 2024 In Dodoma Region

The budget trends for NCD health commodities from the financial year 2021/22 to 2023/24. Overall, the total budget for health commodities has seen a consistent increase over the years. Specifically, in the fiscal year 2021/22 the total budget allocation was more than 979 million in which only TZS 5.8 million (0.6%) was allocated for NCD health commodities. The following financial year, 2022/23, showed an increase in budget allocation on NCD-specific health commodities to TZS 19.6 million equivalent to 1.9% of the overall health commodities budget allocation, in 2023/24 NCD related health commodities were allocated TZS 14.0 million equivalent to 1.1% of overall health commodities.

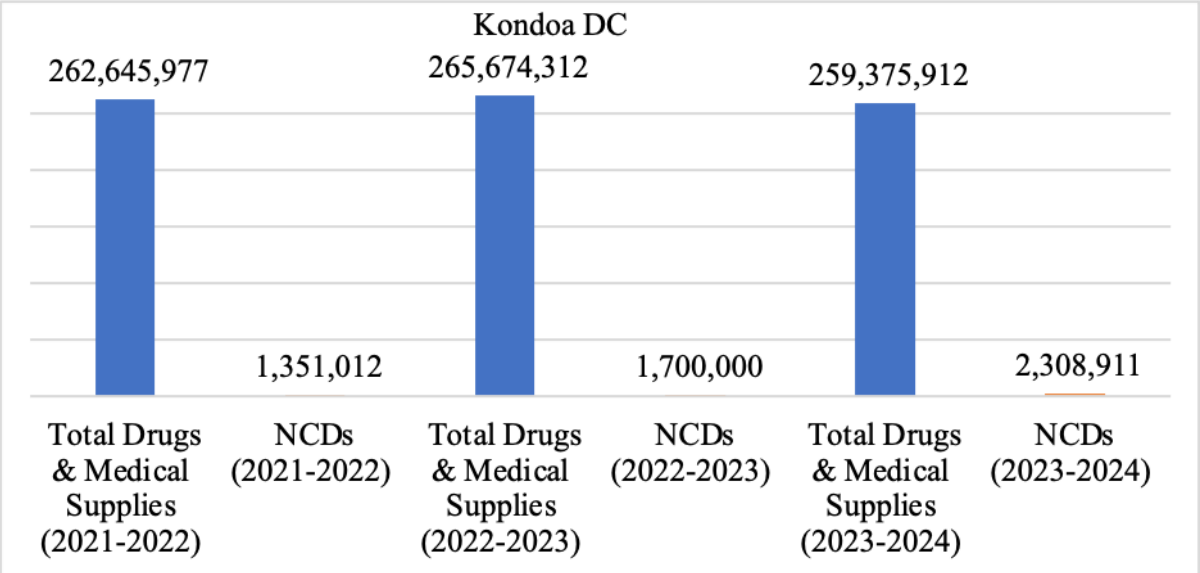
Figure 2: Budget trend (in TZS) for NCD health commodities from the fiscal year 2021/22 to 2023/24 in Dodoma Region



4.3.2 Budget trend (in TZS) for NCD health commodities from the fiscal year 2021/22 to 2023/24 for Kondoa DC

Examining the NCD health commodities at the council levels revealed that in Kondoa DC, there were variations in its budget allocations for NCD health commodities as shown in Figure 3 below. In 2021/22, the total budget for health commodities was 262.6 million, with 1.3 million allocated NCDs. The subsequent fiscal year, 2022/23, saw a slight to 265.67 million an increase of 1.15% of the total budget, and NCD funding increased to 1.7 million which is more than a 20% increase compared to the previous year. By 2023/24, the total budget decreased slightly to TZS 259.4 million but the allocation for NCDs increased to TZS 2.3 million (35.8%), indicating a growing prioritization of NCD health commodities despite the overall budget decrease.

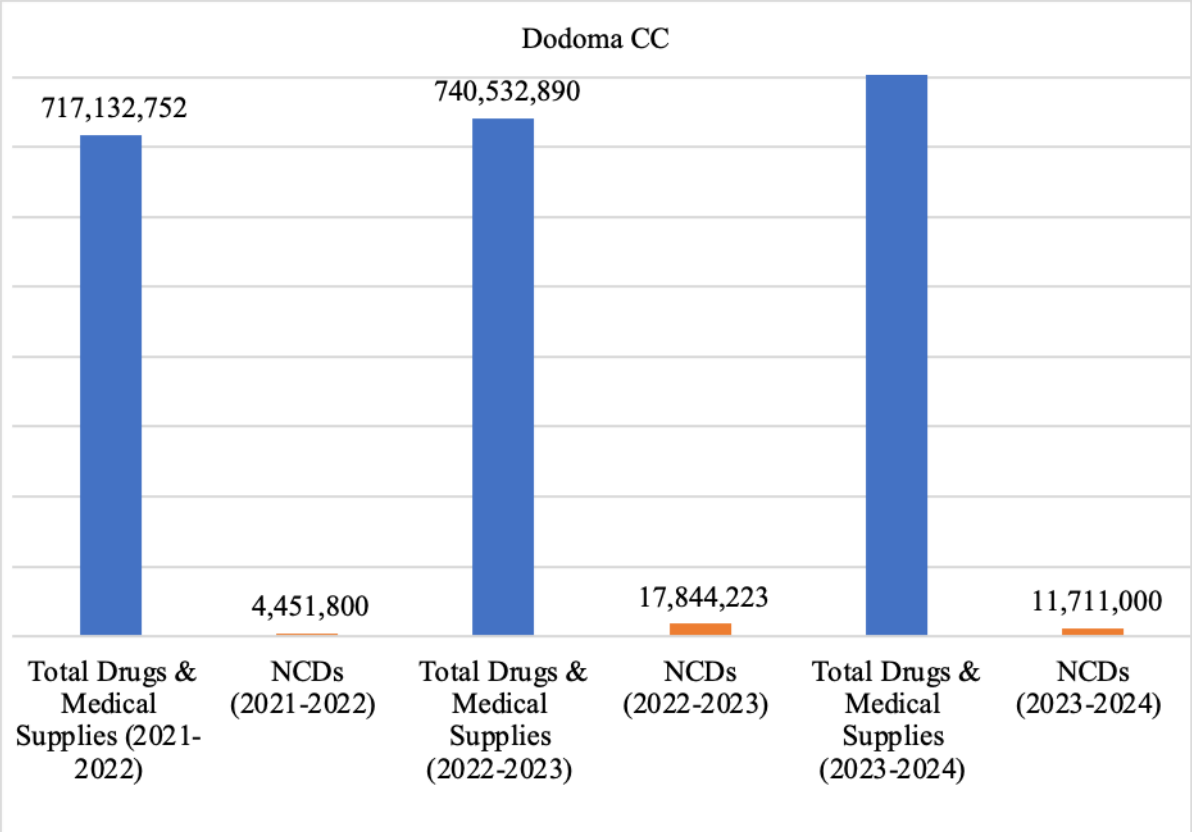
Figure 3: Budget trend (in TZS) for NCD health commodities from the fiscal year 2021/22 to 2023/24 for Kondoa DC



4.3.3 Budget trend (in TZS) for NCD health commodities from the fiscal year 2021/22 to 2023/24 for Dodoma CC

In Dodoma CC, the overall budget for health commodities has increased in all subsequent years, from 2021/22 to 2023/24 as shown in Figure 4 below. However, the NCDs experienced variations in its budget allocations for health commodities with a funding decrease from 17.8 million (2.4%) of total health commodities budget allocation in 2022/23 to 11.7 (1.2%) million in 2023/24.

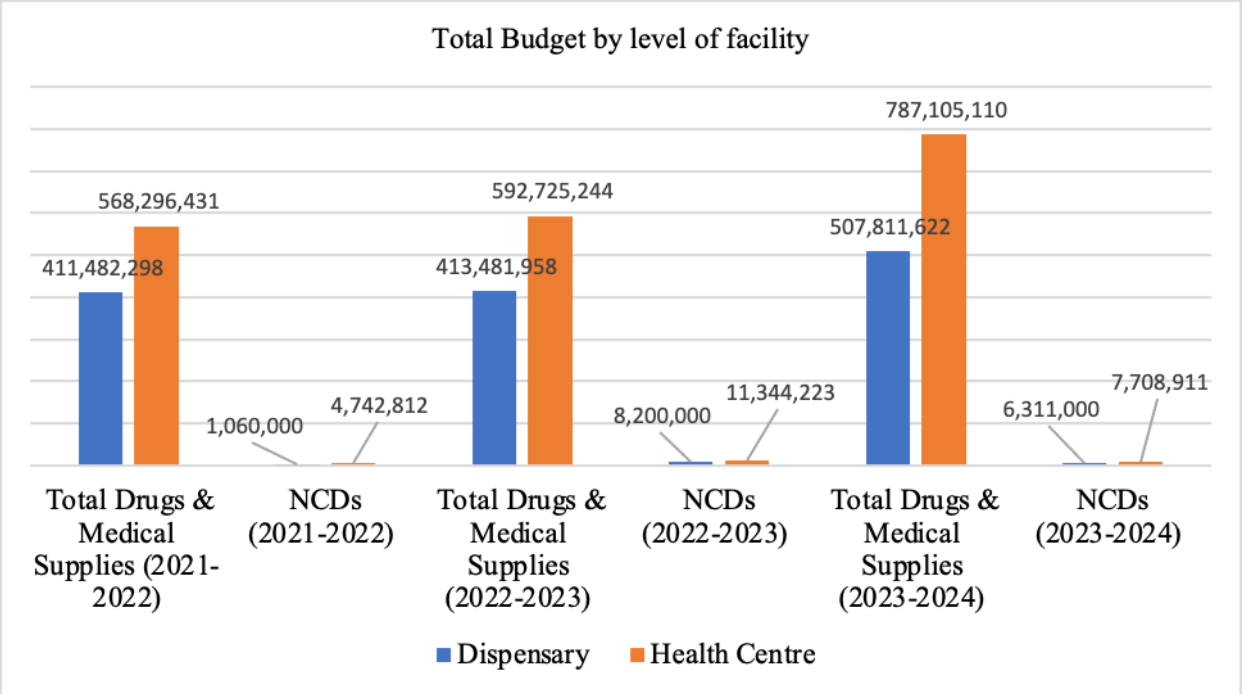
Figure 4: Budget trend (in TZS) for NCD health commodities from the fiscal year 2021/22 to 2023/24 for Dodoma CC



4.3.4 Budget trend (in TZS) for NCD health commodities from the fiscal year 2021/22 to 2023/24 disaggregated by level of health facility

Overall, from 2021/22 to 2023/24, the NCD's budget allocation for dispensaries and health centers showed a mixed trend. In the fiscal year 2021/22, the total health commodities budget was about TZS 411.5 and 568.3 million for dispensaries and health centers respectively, with only TZS 1.06 (0.26%) and TZS 4.7 (0.83%) million allocated for NCD specific health commodities for dispensaries and health centers allocated for NCDs. There was an increase in 2022/23, with the total health commodities budget rising slightly to TZS 413.4 and 592.7 million for dispensaries and health centers, and the allocation for NCD-specific health commodities increased significantly to TZS 8.2 and 11.3 million. However, in 2023/24, although the total health commodity budget for dispensaries and health centers increased substantially to 507.8 and 787.1 million, the funding for NCD-specific health commodities decreased to TZS 6.3 and 7.7 million.

Figure 5: Budget trend for NCD health commodities from the fiscal year 2021/22 to 2023/24 disaggregated by level of health facility

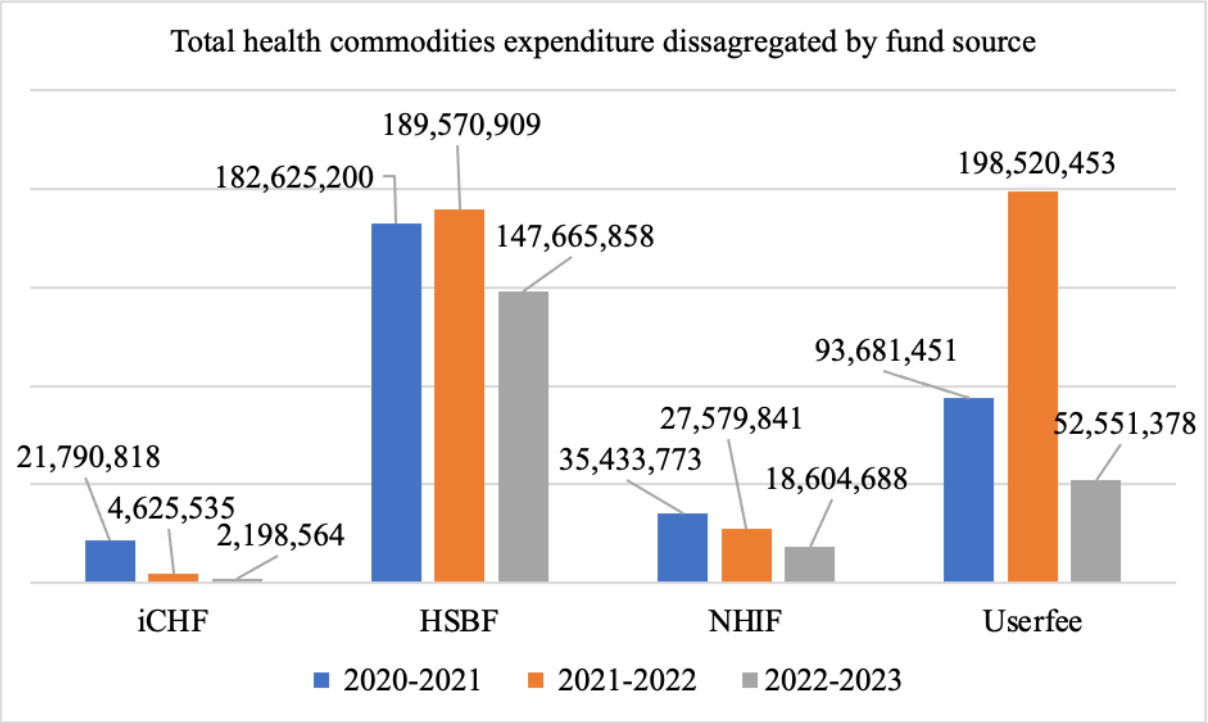


4.4 The total expenditure trend for health commodities disaggregated by fund source

In the fiscal year 2020/21, the total expenditure on health commodities was contributed by different funding sources, which are iCHF, HSBF, NHIF, and User fees. The iCHF contributed 21.8 million, HSBF 18.6 million, NHIF 35.4 million, and User Fees 93.6 million. This distribution highlights the reliance on diverse funding streams to support healthcare needs, with HSBF and User Fees being the predominant sources. The significant contributions from these sources indicate their crucial role in financing healthcare services and ensuring the availability of essential medicines.

The fiscal year 2021/22 showed a varied pattern in health commodities expenditure across different funding sources. The iCHF allocation decreased to 4.6 million, while HSBF increased to 189.57 million, NHIF decreased to 27.6 million, and User Fees saw a substantial rise to 198.5 million.

Figure 6: Total expenditure trend for health commodities from the fiscal year 2020/21 to 2022/23 disaggregated by fund source



4.5 The availability of hypertensive and diabetic health commodities in the selected primary health care facilities in Dodoma region from 2021 to 2023

The overall availability trends for hypertensive and diabetic commodities have generally improved over the years with an increase from 86% to 93% for 2021 to 2023, respectively.

Figure 7: Availability of hypertensive and diabetic health commodities in the selected primary health care facilities in Dodoma region from 2021 to 2023

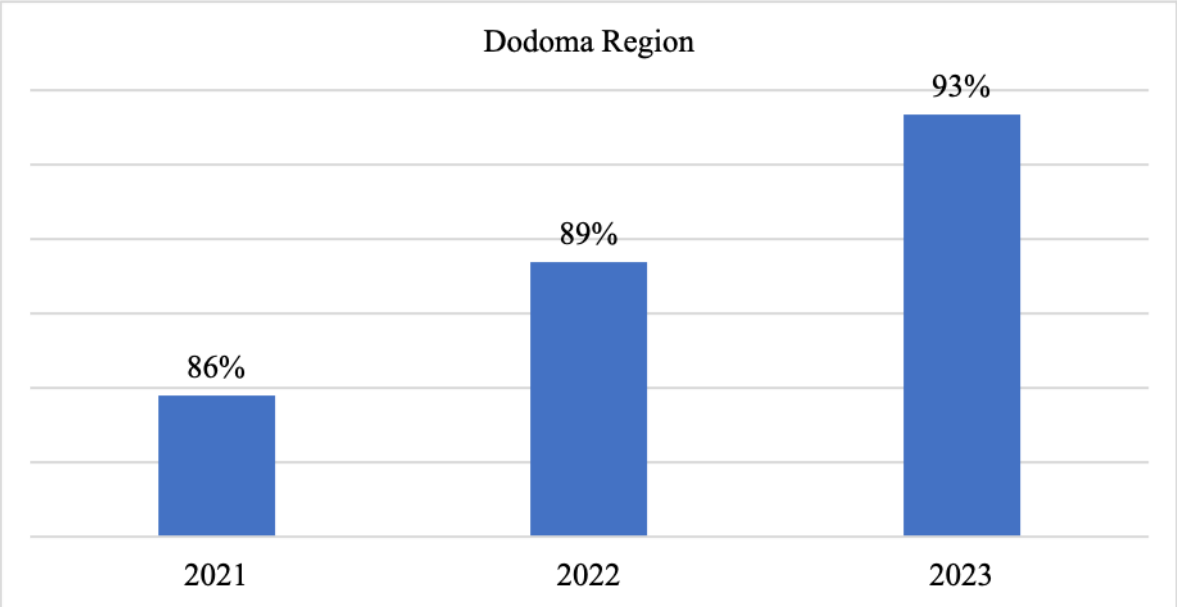
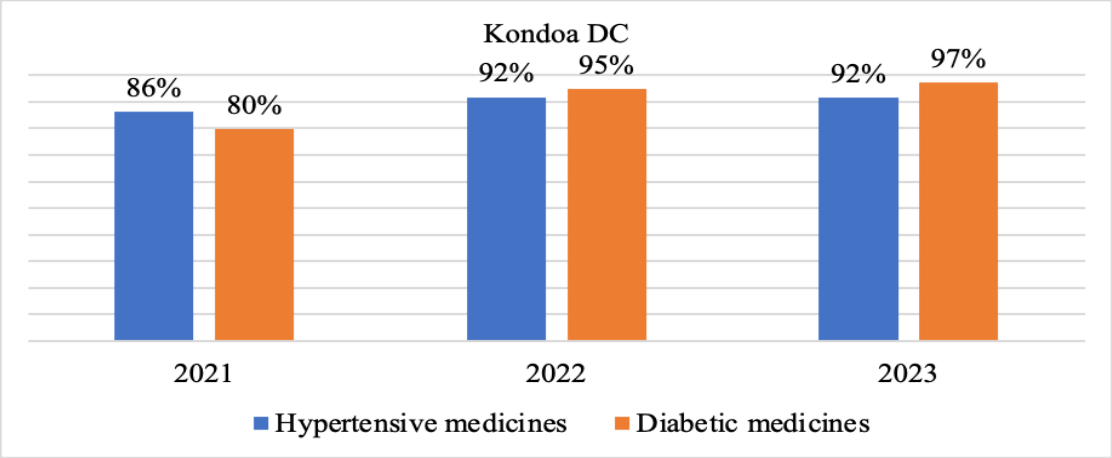


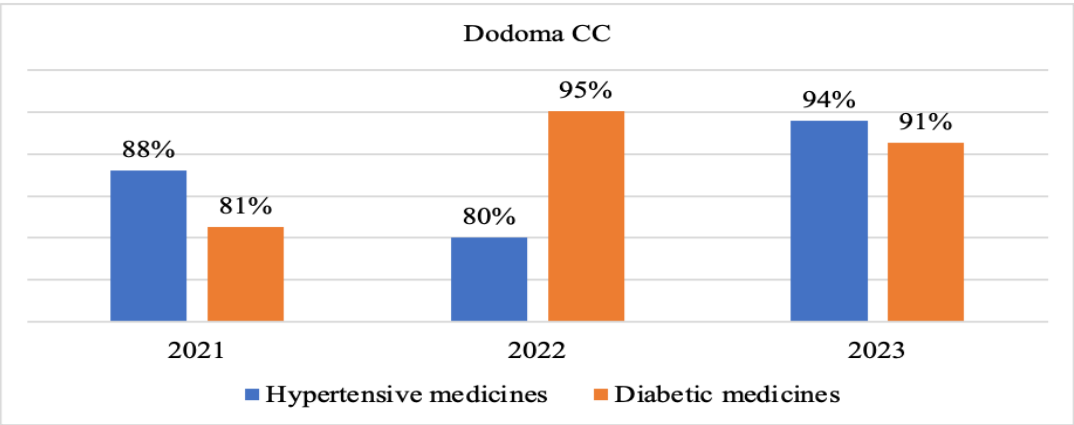
Figure 8 below presents the availability of hypertensive and diabetic health commodities in the selected primary health care facilities in Kondoa DC. The overall availability trends for hypertensive and diabetic commodities have generally improved over the years. Specifically, the availability of diabetic health commodities was higher compared to the hypertensive commodities, except for the fiscal years 2020/21.

Figure 8: Overall availability of Diabetic and hypertensive commodities in Kondoa DC



The differences were observed for Dodoma CC as shown in figure 9 below. Similar improvements were noted, but there were significant variations in the availability of both, hypertensive and diabetic health commodities between fiscal years.

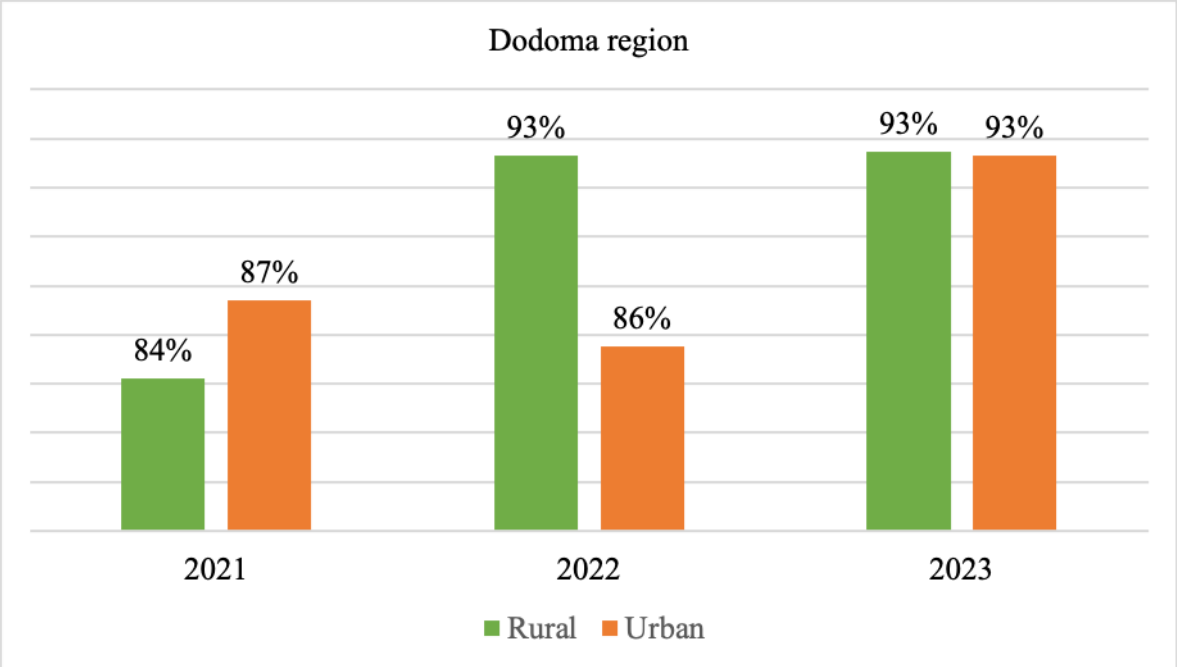
Figure 9: Overall availability of Diabetic and hypertensive commodities in Dodoma MC



4.6 The disparities in the availability of diabetic and hypertensive commodities between urban and rural DHFF implementation areas.

Figure 10 below presents the disparities in the availability of diabetic and hypertensive commodities between urban and rural DHFF implementation areas in the Dodoma Region. Urban and rural areas showed varying levels of availability, with some improvement over the years.

Figure 10: Disparities in the availability of diabetic and hypertensive commodities between urban and rural DHFF implementation areas



Tables 3 and 4 below present the disparities in the availability of diabetic and hypertensive health commodities between urban and rural DHFF implementation areas. Overall, there was a significant difference in the availability of diabetic commodities between urban and rural areas each year, with rural areas consistently having higher availability compared to urban areas (*as shown in Table 3*). However, differences were observed in the availability of hypertensive commodities (*as shown in table 4*), whereby, there was no significant difference between rural and urban areas in financial years, 2020/21 and 2021/22. Furthermore, in the financial year 2022/23, there was a significant difference in the availability of hypertensive commodities (*p-value <0.008*), with urban areas having a significantly higher availability.

Table 3: Disparities in the availability of diabetic commodities between rural and urban areas

Year	Urban (% of availability)		Rural (% of availability)		*p-value for diabetics*
	No. of HF	Diabetic commodities	No. of HF	Diabetic commodities	
2020/21	38	24%	33	52%	<0.015
2021/22	40	35%	38	76%	<0.000
2022/23	43	44%	39	85%	<0.000

Table 4: Disparities in the availability of hypertensive commodities between rural and urban areas

Year	Urban (% of availability)		Rural (% of availability)		*p-value for hypertension*
	Num of Health Facilities	Hypertensive commodities	Number of Health Facilities	Hypertension commodities	
2020/21	38	58%	33	58%	1.000
2021/22	40	60%	38	68%	0.462
2022/23	43	100%	39	85%	<0.008

4.7 Proportional health facilities with diabetic and hypertensive health commodities in Dodoma CC and Kondoa DC

The availability of essential NCD health commodities has improved over the years for both hypertensive and diabetic health commodities. This highlights the progress in addressing NCDs in the Dodoma region.

Figure 11: Proportional health facilities with diabetic and hypertensive health commodities in Dodoma CC

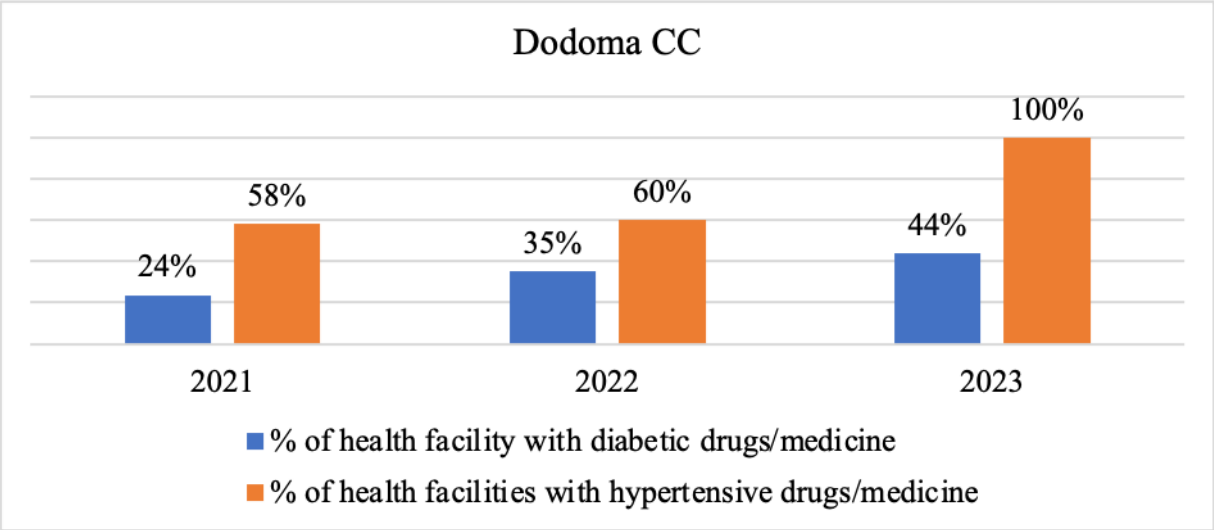
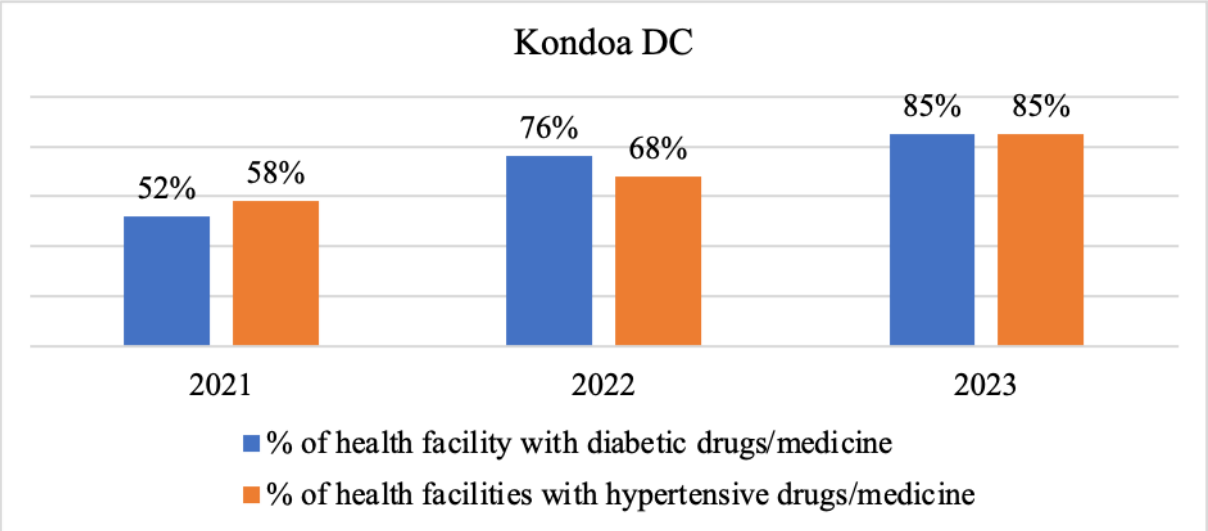


Figure 12: Proportional health facilities with diabetic and hypertensive health commodities in Kondoa CC



CHAPTER FIVE

5.0 DISCUSSION

5.0 Planning and budgeting for Non-Communicable Diseases

The study findings reveal that through DHFF reforms there has been a consistent increase in the overall budget for health commodities and NCD-specific health commodities over the years, indicating a potential shift in prioritization or funding strategies for NCDs within the districts. Furthermore, when disaggregated by the level of health facilities, the findings suggested a consistent increase in the overall budget for health commodities as well as NCDs commodities for both dispensaries and health centers. However, in the financial year 2023/24, there was a decrease in the total budget for NCD commodities for both dispensaries and health centers despite the overall budget increase for health commodities. This reflects a shift in budget priorities in the financial year 2023/24 where the government intends to improve the health services and infrastructures in dispensaries and health centers. Similar findings have been observed from other studies that indicated an increase in budgeting accountability of health facility governing committees to 78% since the introduction of DHFF, meaning that, the DHFF reforms gave autonomy to health facilities on planning, budgeting, and spending multiple sources of funds through FFARS (21,25). Furthermore, DHFF reform gives autonomy to health facilities on planning, budgeting, and spending multiple sources through FFARS (21)

Looking at the overall expenditure through FFARS on health commodities, the findings revealed that expenditures varied over the years and by source of funding. Health facilities in urban areas had high expenditure compared to health facilities located in rural. Despite low expenditure among health facilities in rural compared to urban areas, the expenditure increased over the years, which indicates the shift in prioritization. The study found that financing for health commodities through FFARS is highly donor-dependent on HSBF and user fees which are out-of-pocket payments and a cost-sharing mechanism. Despite the overall user fee being higher in urban areas with variation health commodities financing in rural areas through the same funding source was increasing over the years. This means the majority of individuals pay out of pocket/cash when accessing health care services at the health centers and dispensaries. These calls upon the government to improve financial protection by reducing out-of-pocket/cash spending on health care services to ensure

DHFF reform's positive impacts are sustainable in improving the availability of health commodities(10).

5.1 Effect of DHFF and the availability of health commodities

The findings suggest an improvement in the overall availability of hypertensive and diabetic health commodities in the selected primary healthcare facilities over the years. This has been contributed by the increase in overall budgeting and expenditure for health commodities in primary healthcare facilities over the three years as observed in this study. A study conducted in Tanzania looking at the implication of DHFF on the availability of health commodities in primary healthcare facilities found that at the start of DHFF implementation, the average health commodity availability was 69%. After reform implementation, this increased to a peak of 78% just in one year(25).

. The introduction of the prime vendor system has also facilitated the supply of health commodities to primary health facilities, as now these facilities have the autonomy to purchase commodities through the Prime Vendor System by use of complementary funds like HSBF, user fee, NHIF or iCHF (23). Similar findings have been observed from other studies that revealed an overall increase (80%) in the supply of medicines and medical commodities as the result of DHFF reforms in the Tanga region (20).

Another study that was conducted in Pangani district to assess the impact of Direct Health Facility Financing (DHFF) on enhancing maternal health indicates a positive effect on maternal health service provision showed an increase in the availability of medical supplies, equipment, and reagents essential for delivering maternal health services (15). This provides evidence that the reform has improved the overall availability of health commodities for NCDs, maternal health services, and child health services. More studies should be conducted to assess the impact of DHFF on other health service indicators that aren’t documented in the literature.

5.2 Disparities in the availability of health commodities between urban and rural areas

The study findings revealed there was a significant difference in the availability of diabetic commodities between urban and rural areas each year, with rural areas consistently having higher availability compared to rural areas. However, differences were observed in the availability of hypertensive commodities there was no significant difference between rural and urban areas in the financial years, 2020/21 and 2021/22. Furthermore, in the financial year 2022/23, there was a significant difference in the availability of hypertensive commodities (*p-value <0.008*), with urban areas having a significantly higher availability. Specifically, the availability of diabetic health commodities was higher compared to the hypertensive commodities in urban settings. Other studies also revealed that, in urban settings, there is a slight variation in the availability of health commodities whereby the overall availability was high for hypertensive health commodities. These demonstrate the higher need for hypertensive commodities in urban areas and it might be due to the higher burden of the disease, health-seeking behaviors, geographical location of health facilities, and ability to pay among urban population (26). Similar findings have also been observed in other studies that indicated a significant difference in the availability of maternal health commodities between rural and urban areas, thus calling for policymakers to consider the rural-urban context when crafting strategies to address the disparities in the availability of healthcare commodities which further influence health care access and utilization (14). Another piece of evidence from Tanzania revealed a notable difference in overall health commodities financing between the urban and rural divide as the result of DHFF implementation (8). This difference could be also attributed to the amount allocated and planned for healthcare facilities to be less in rural compared to urban. The evidence from a study conducted in Tanzania found that, on average, urban health facilities were likely to spend a higher percentage of their budget on health commodities compared to rural ones (25). This also indicates disparities that exist between primary healthcare facilities located in rural and urban areas. Therefore, there is a need for more studies into the causes of these disparities and to come out with doable actions to improve the situation for equity provision of health services in these areas of DHFF implementation.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

The findings from this study suggest an overall increase in the availability of NCDs (diabetic and hypertensive) health commodities is contributed by DHFF reforms implementation by primary health facilities. Also, the study found disparities in the availability of NCD health commodities between facilities located in rural and urban areas with better availability in urban. Furthermore, facilities in urban DHFF implementation areas were found to have spent more funds on overall health commodities compared to rural ones. This indicates that despite overall improvements in the availability of NCDs which were contributed by an increase in budget allocation and expenditure on health commodities in both rural and urban areas but increase was higher in urban than rural areas which indicates the divide among geographical locations of Healthcare facilities as well as among level of healthcare facilities with health centers getting large share in budget allocation compared dispensaries despite of them being minority in number. So, there is a need for the health sector to address these disparities as we move toward Universal Health Coverage (UHC) in 2030.

6.2 Recommendations

Based on the study findings, the following should be done.

1. The Ministry of Health and PORALG should develop guidelines on allocation percent for NCDs for the primary healthcare facilities. This will address the variation in budget allocation for NCDs observed.
2. The government has to explore and secure diverse and reliable funding sources for Health commodities and reduce reliance on donors (HSBF) and user fees, which in the long run are sustainable and reliable.
3. The Ministry of Health should put a policy in place to address disparities in the availability of NCD health commodities among health facilities in rural and urban geographical settings.
4. PORALG should improve its planning and budgeting system (PlanRep) and Expenditure system (FFARS) to make them well integrated, as currently, you can have a plan and budget for NCDs but you cannot track its expenditure in FFARS.

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APPENDICES

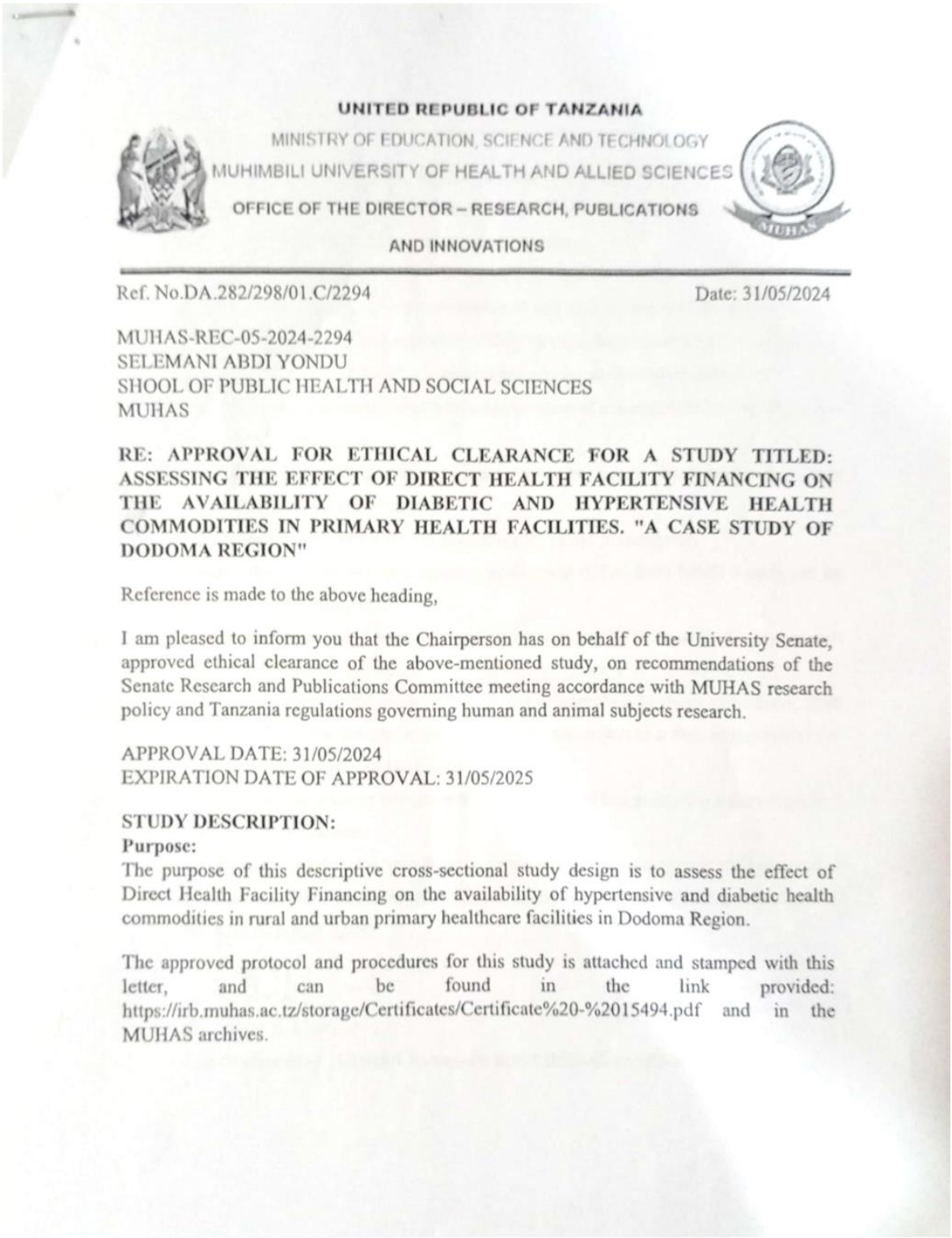
Appendix 1a: Data extraction form

Region	District	Facility Name	Facility code	Budget Allocation	Expenditure

Appendix 1b: data extraction form

S/N	Facility Code	Facility	Facility Type	District	Region	Period	Product Code	Product	Availability

Appendix 2: Ethical approval



UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY
MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
OFFICE OF THE DIRECTOR – RESEARCH, PUBLICATIONS AND INNOVATIONS

Ref. No.DA.282/298/01.C/2294 Date: 31/05/2024

MUHAS-REC-05-2024-2294
SELEMANI ABDI YONDU
SHOOL OF PUBLIC HEALTH AND SOCIAL SCIENCES
MUHAS

RE: APPROVAL FOR ETHICAL CLEARANCE FOR A STUDY TITLED: ASSESSING THE EFFECT OF DIRECT HEALTH FACILITY FINANCING ON THE AVAILABILITY OF DIABETIC AND HYPERTENSIVE HEALTH COMMODITIES IN PRIMARY HEALTH FACILITIES. "A CASE STUDY OF DODOMA REGION"

Reference is made to the above heading,

I am pleased to inform you that the Chairperson has on behalf of the University Senate, approved ethical clearance of the above-mentioned study, on recommendations of the Senate Research and Publications Committee meeting accordance with MUHAS research policy and Tanzania regulations governing human and animal subjects research.

APPROVAL DATE: 31/05/2024
EXPIRATION DATE OF APPROVAL: 31/05/2025

STUDY DESCRIPTION:
Purpose:
The purpose of this descriptive cross-sectional study design is to assess the effect of Direct Health Facility Financing on the availability of hypertensive and diabetic health commodities in rural and urban primary healthcare facilities in Dodoma Region.

The approved protocol and procedures for this study is attached and stamped with this letter, and can be found in the link provided: https://irb.muhas.ac.tz/storage/Certificates/Certificate%20-%2015494.pdf and in the MUHAS archives.

The PI is required to:

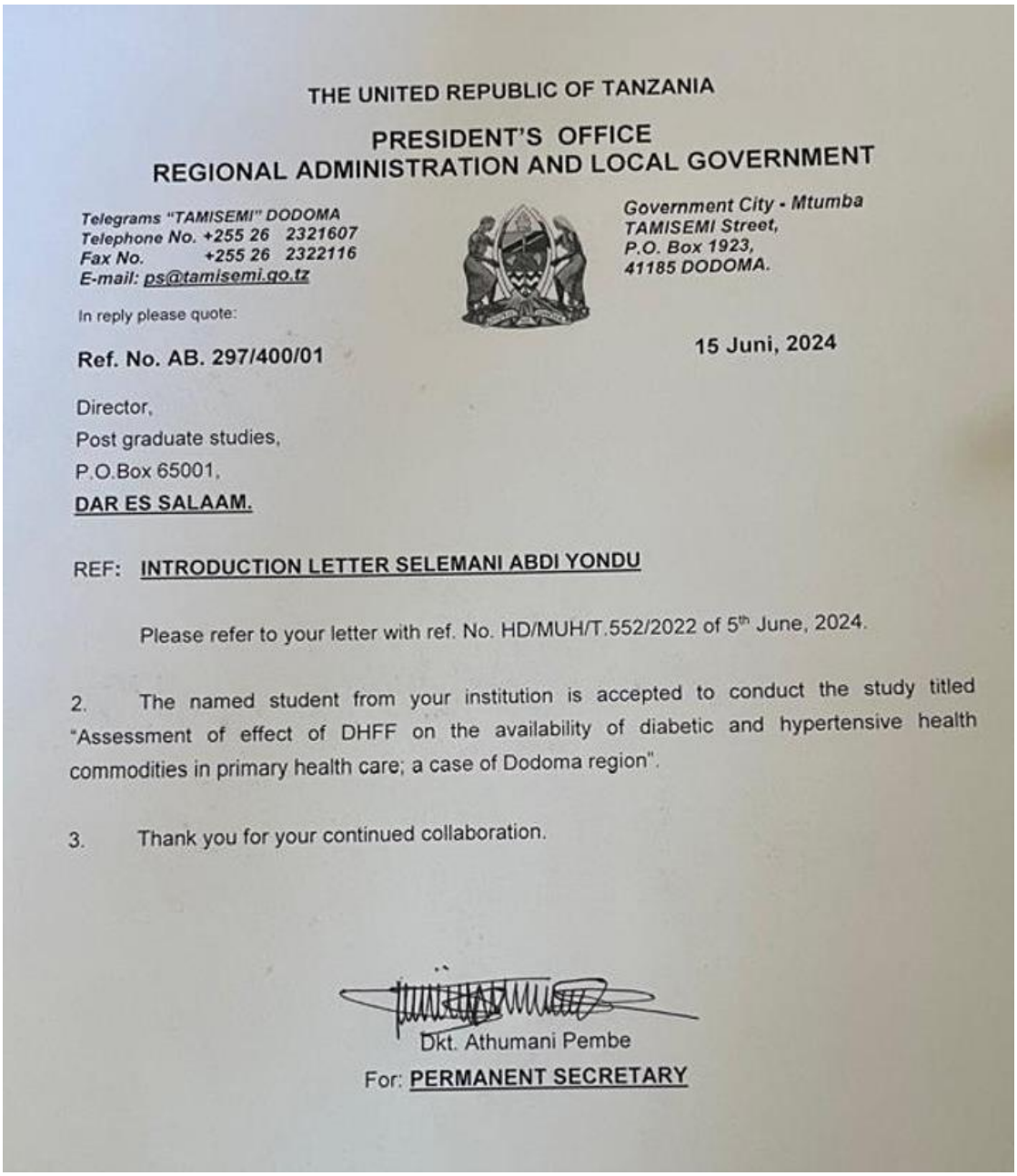
1. Submit bi-annual progress reports and final report upon completion of the study.
2. Report to the IRB any unanticipated problem involving risks to subjects or others including adverse events where applicable.
3. Apply for renewal of approval of ethical clearance one (1) month prior its expiration if the study is not completed at the end of this ethical approval. You may not continue with any research activity beyond the expiration date without the approval of the IRB. Failure to receive approval for continuation before the expiration date will result in automatic termination of the approval for this study on the expiration date.
4. Obtain IRB amendment (s) approval for any changes to any aspect of this study before they can be implemented.
5. Data security is ultimately the responsibility of the investigator.
6. Apply for and obtain data transfer agreement (DTA) from NIMR if data will be transferred to a foreign country.
7. Apply for and obtain material transfer agreement (MTA) from NIMR, if research materials (samples) will be shipped to a foreign country,
8. Any researcher, who contravenes or fail to comply with these conditions, shall be guilty of an offence and shall be liable on conviction to a fine as per NIMR Act No. 23 of 1979, PART III section 10 (2)
9. The PI is required to ensure that the findings of the study are disseminated to relevant stake holders.
10. PI is required to be versed with necessary laws and regulatory policies that govern research in Tanzania. Some guidance is available on our website https://drp.muhas.ac.tz/.

Dr. Nahya S. Masoud

For Chairperson, MUHAS Research and Ethics Committee

Muhimbili University of Health and Allied Sciences
DIRECTOR
Research & Publications
Box 65001

Appendix 3: A letter notifying acceptance to conduct study at PORALG



THE UNITED REPUBLIC OF TANZANIA

PRESIDENT'S OFFICE
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT

Telegrams "TAMISEMI" DODOMA
Telephone No. +255 26 2321607
Fax No. +255 26 2322116
E-mail: ps@tamisemi.go.tz

Government City - Mtumba
TAMISEMI Street,
P.O. Box 1923,
41185 DODOMA.

In reply please quote:

Ref. No. AB. 297/400/01

15 Juni, 2024

Director,
Post graduate studies,
P.O.Box 65001,
DAR ES SALAAM.

REF: **INTRODUCTION LETTER SELEMANI ABDI YONDU**

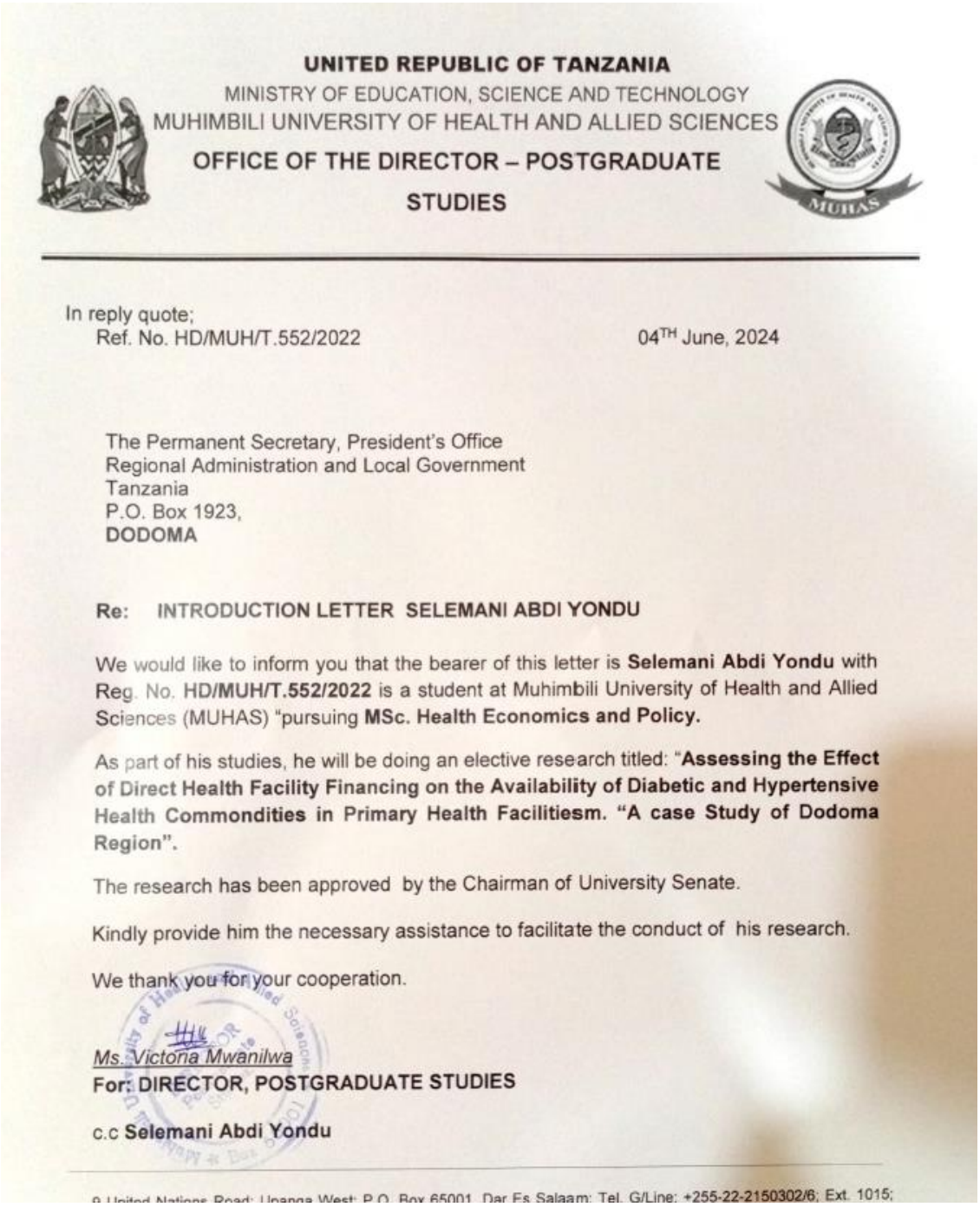
Please refer to your letter with ref. No. HD/MUH/T.552/2022 of 5th June, 2024.

2. The named student from your institution is accepted to conduct the study titled "Assessment of effect of DHFF on the availability of diabetic and hypertensive health commodities in primary health care; a case of Dodoma region".

3. Thank you for your continued collaboration.

Dkt. Athumani Pembe
For: **PERMANENT SECRETARY**

Appendix 4: Introduction letter to PORALG from the University



UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY
MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
OFFICE OF THE DIRECTOR – POSTGRADUATE STUDIES

In reply quote;
Ref. No. HD/MUH/T.552/2022 04TH June, 2024

The Permanent Secretary, President's Office
Regional Administration and Local Government
Tanzania
P.O. Box 1923,
DODOMA

Re: INTRODUCTION LETTER SELEMANI ABDI YONDU

We would like to inform you that the bearer of this letter is **Selemani Abdi Yondu** with Reg. No. **HD/MUH/T.552/2022** is a student at Muhimbili University of Health and Allied Sciences (MUHAS) "pursuing **MSc. Health Economics and Policy.**

As part of his studies, he will be doing an elective research titled: "**Assessing the Effect of Direct Health Facility Financing on the Availability of Diabetic and Hypertensive Health Commondities in Primary Health Facilitiesm. "A case Study of Dodoma Region".**

The research has been approved by the Chairman of University Senate.

Kindly provide him the necessary assistance to facilitate the conduct of his research.

We thank you for your cooperation.

Ms. Victoria Mwanilwa
For: DIRECTOR, POSTGRADUATE STUDIES

c.c **Selemani Abdi Yondu**

9 United Nations Road; Upanga West; P.O. Box 65001, Dar Es Salaam; Tel. G/Line: +255-22-2150302/6; Ext. 1015;

Appendix 5: Turnitin Receipt

turnitin

Digital Receipt

This receipt acknowledges that Turnitin received your paper. Below you will find the receipt information regarding your submission.

The first page of your submissions is displayed below.

Submission author:	Selemani Abdi Yondu
Assignment title:	Proposal check
Submission title:	Final_thesis_Selemani_23_07_2024 GR.pdf
File name:	Final_thesis_Selemani_23_07_2024_GR.pdf
File size:	1.31M
Page count:	48
Word count:	9,220
Character count:	58,716
Submission date:	23-Jul-2024 02:37PM (UTC+0300)
Submission ID:	2306652379


ASSESSING THE EFFECT OF DIRECT HEALTH FACILITY FINANCING ON THE AVAILABILITY OF DIABETIC AND HYPERTENSIVE HEALTH COMMODITIES IN PRIMARY HEALTH FACILITIES; A CASE STUDY OF DODOMA REGION

Selemani Abdi Yondu

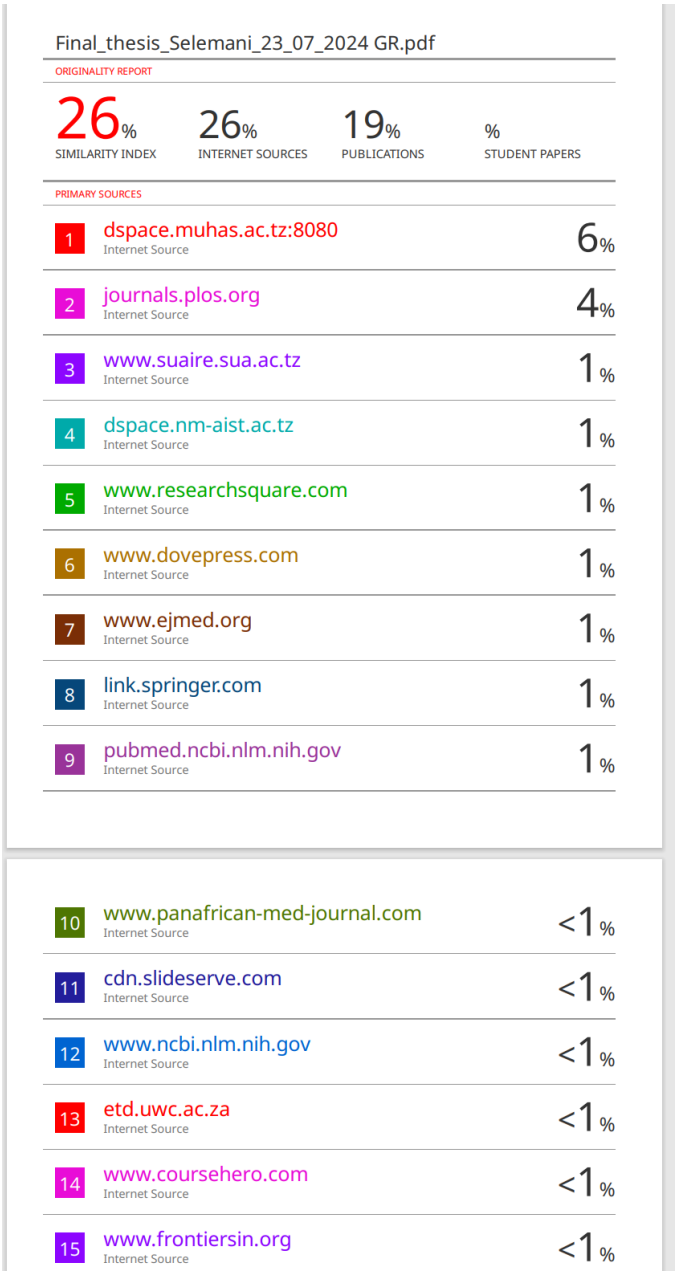
Masters of Science in Health Economics and Policy

Muhimbili University of Health and Allied Sciences

July, 2024

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Appendix 6: Plagiarism Thesis



Final_thesis_Selemani_23_07_2024 GR.pdf

ORIGINALITY REPORT

26%	26%	19%	%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

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